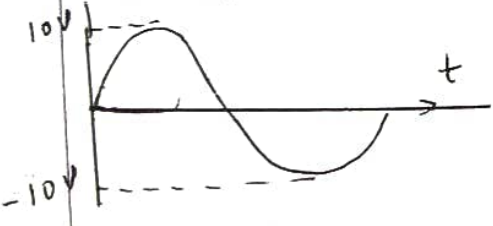
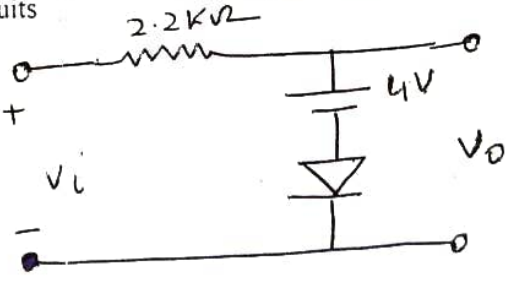


DEPARTMENT of ELECTRONICS & COMMUNICATION ENGINEERING
 CLASS TEST -II(2023-2024)
 FUNDAMENTALS OF ELECTRONICS ENGINEERING (IEC 101)
 MM-10

TIME: 1 HR

ATTEMPT ALL QUESTIONS

Q.No.	Question Paper Based On Course Outcomes According To Bloom's Cognitive Level	Marks	CO
1	Explain the input output characteristics of a transistor in CE configuration with a suitable diagram. The value of beta for a transistor is 100. if the value of emitter current is 10mA then determine the value of collector and base current.	4	CO 2
2	Explain the working of tunnel diode and tunneling effect with a neat diagram. A half wave rectifier is utilized to supply 20 volt d.c to a resistive load of 400Ω. The diode used in HWR has a forward resistance of 40Ω. Determine the maximum value of the a.c voltage required at the input	3	CO 1
3	Draw the output waveform for the given circuits  	3	CO1

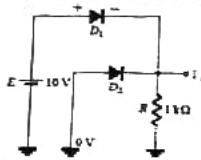
B.TECH.
(SEM I) ODD SEMESTER EXAMINATION 2023-24
FUNDAMENTALS OF ELECTRONICS ENGINEERING

[TIME: 3 hrs.]

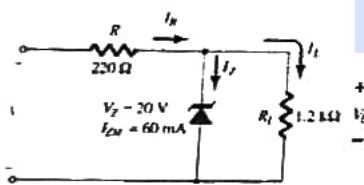
[Max. Marks: 70]

Note: Attempt All Questions. All Question carry equal marks.

- Q1** Answer ALL parts. Marks
- (a) Calculate the dynamic forward and reverse ~~resistance~~ ^{conductance} of a PN junction diode when the applied voltage is 0.25V at T=300°K given $I_s=2\mu A$. 3.5
- (b) Determine the voltage V_0 for the following figure. Both the Silicon diodes are practical and has threshold voltage of 0.7V. 3.5



- (c) Determine the range of values of V_i that will maintain the Zener diode shown in the following circuit in the "on" state. 3.5



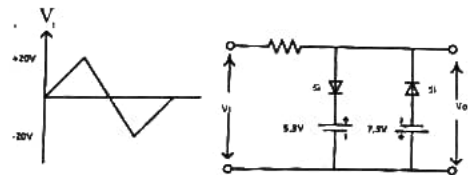
OR

Explain the working of Voltage Quadruple Circuit with the help of neat diagram. Write the PIV rating for each diode used in the circuit.

- (d) List the performance comparison of Tunnel Diode and P-N junction diode. Also, draw their characteristic curves. 3.5

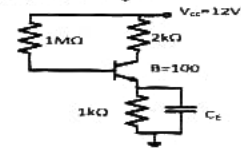
OR

Sketch the output waveform for the given network shown in figure.



Q2 Answer ALL parts.

- (a) Write a difference between BJT and JFET. Draw and explain the input and output characteristic of a NPN transistor of CE configuration. 3.5
- (b) Calculate I_C and I_E for a transistor that has $\alpha=0.98$ and $I_B=100\mu A$. Find the value of β of the transistor. Calculate the current I_E , I_C , and I_B for the following circuit as shown in figure. 7



OR

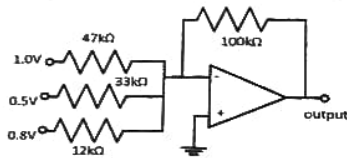
- A FET has a driven current of 4mA if $I_{DSS} = 8mA$, $V_{GS(OFF)} = -6V$. Find the value of V_{GS} and Pinch off voltage (V_P). Show that the transconductance g_m of JFET is related to drain current I_{DS} by $g_m = \frac{2}{V_P} \sqrt{I_{DSS} I_{DS}}$ 7

Q3 Answer ALL parts.

- (a) Draw the Pin diagram of operational amplifier. Enlist the ideal characteristic of Op-amp and explain the following terms Slew rate and CMMR. 7

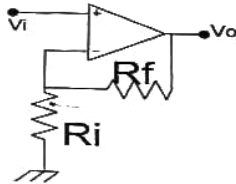
OR

Find out the voltage of the following circuit as shown in figure.



7

- (b) (i) Draw and explain the circuit of Integrator using OPAM. 7
 (ii) Find the output voltage in terms of input voltage for the given circuit of figure.



- Q4 Answer ALL parts. 7
 (a) Minimize the following expression using k-map and realize it using basic gates. 7
 $F(A, B, C, D) = \sum m(1, 2, 9, 10, 11, 14, 15) + D(0, 5, 8)$
 (b) Apply DE Morgan's rules and simplify the following Boolean expression. Also write the law used. 7

- (i) $\overline{A(B+C)} + \overline{AB} + \overline{C(A+B)}$
 (ii) $\overline{A(B+C)}(A+B+C)(\overline{A}\overline{B}\overline{C})$

OR

- (i) Convert $(725.25)_8$ to its decimal, binary and hexadecimal equivalent. 7
 (ii) Find x if $(193)_x = (623)_8$

- Q5 Answer ALL parts. 7
 (a) Write short notes on:
 (i) Need of Modulation
 (ii) Frequency Reuse concept
 (iii) Amplitude Modulation

- (b) (i) The unmodulated carrier power of an AM wave is 8kW and rises to 10kW after modulation. Determine modulation Index. 7
 (ii) The unmodulated rms current of an AM wave is 8.93A and increase to 11.25A with modulation. Determine the modulation index. 7

OR

Explain the different generations of Wireless and Mobile communication in brief.

CO-BL Mapping

Odd Semester Examination 2023-24			
Subject Code: IEC-101			
Subject Name: Fundamentals of Electronics Engineering			
Q.No.	Marks	CO	BL
1(a)	3.5	1	2
1(b)	3.5	1	3
1(c)	3.5	1	3
1(d)	3.5	1	1
2(a)	7	2	3
2(b)	7	2	1
3(a)	7	3	4
3(b)	7	3	2
4(a)	7	4	2
4(b)	7	4	3
5(a)	7	5	1
5(b)	7	5	2